A Property-Sharing Constraint in Centering

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Original centering rule (Grosz)

(1) If the Cb of the current utterance is the same as the Cb of the previous utterance, a *pronoun* should be used:
A pronoun realizes the current Cb that continues the previous Cb

Further Constraint

Property-sharing Constraint (refers to the grammatical function SUBJECT)
Two pronominal elements realizing the same Cb in adjacent utterances share a certain common grammatical property.

Subject-Constraint for Japanese

To realise the Cb a
zero-pronominal
(unexpressed subject or object not morphologically marked which distinguishes them from the pro-drop, e.g. Spanish or Italian) is used
For the basic centering rule you can change the word pronoun for zero-pronominal

Examples

(2)

1. Rosa wa dare o matte-iru no-desu ka
   Rosa TP-SB who OB is-waiting-for ASN Q
   "Who is Rosa waiting for?"

2. Φ Mary o matte-iru no-desu.
   SB Mary OB is-waiting-for ASN Q
   "[She] is waiting for Mary."
   [Cb=Rosa]

(3)

1. Dare go Rosa o matte-iru no-desu ka.
Who SB Rosa OB is-waiting-for ASN Q
"Who is waiting for Rosa?"

2. Mary ga Φ matte-iru no-desu.
Mary SB OB is-waiting-for ASN
"Mary is waiting for [her]."
[Cb= Rosa]

(4)

Φ Φ Yuusyoku ni syootaisi-ta no-desu.
SB OB supper to invited ASN
"[She] invited [her] to dinner."

After (2): strong preference: Rosa invited Mary
After (3): weak preference: Mary invited Rosa

(5)

Φ Rosa ni yuusyoku ni syootais-are-ta no-desu.
SB Rosa by supper to was-invited ASN
"[She] was invited by Rosa to dinner."
(she = Mary)

after (2): marginal (*?)
after (3): acceptable

(6)

Centering-Constraint for Japanese (first approximation)
Two zero pronominals that retain the same Cb in adjacent utterances should share one of the following properties:
SUBJECT or nonSUBJECT.

(7)

(2)(2)"[She] is waiting for Mary." [Cb=Rosa] : **[Cb<subj>=Rosa]**

(4)"[She] invited [her] to dinner."
After (2): strong preference: Rosa invited Mary : **[Cb<subj>=Rosa]**

(8)
(3)(2) “Mary is waiting for [her].”[Cb= Rosa] : **[Cb<obj>=Rosa]**

(4)“[She] invited [her] to dinner.”
After (3): weak preference: Mary invited Rosa : **[Cb<obj>=Rosa]**

(9)
Centering-Constraint for Japanese (2nd approximation)
Two zero pronominals that retain the same Cb in adjacent utterances should share on of the following properties (*in descending order of preference*): 1.) SUBJECT, 2.) nonSUBJECT:

(10)
“Who is Rosa waiting for?”
(2)(2)“[She] is waiting for Mary.” [Cb=Rosa] : **[Cb<subj>=Rosa]**
(5)[marginal]: “[She] was invited by Rosa to dinner.”
(she = Mary) : *?**[Cb<subj>=Mary]**

(11)
“Who is waiting for Rosa?”
(3)(2) “Mary is waiting for [her].”[Cb= Rosa] : **[Cb<obj>=Rosa]**
(5)[acceptable]: “[She] was invited by Rosa to dinner.”
(she = Mary) : *?**[Cb<subj>=Mary]**

(12)

(3)“Who is waiting for Rosa?”
“Mary is waiting for [her].”
[Cb= Rosa]
(4)“[She] invited [her] to dinner.”
1. **[Cb<obj>=Rosa]**
2. ?? [**Cb<subj>=Rosa]**

English Examples

(13)
1. Who is Max waiting for?
2. He is waiting for Fred.
[**Cb<subj>=Max]**

3a. He invited him for dinner.
[strong preference: Max invited Fred]

3b. *? He was invited by Max to dinner.

(14)
1.Who is waiting for Max?
3. Fred is waiting for him.
[Cb<nonSUBJ>=Max]

He invited him to dinner.
[weak preference: Fred invited Max]

3b. *? He was invited by Max to dinner.

(15)
Centering Constraint [general] (approximation)
Two pronominal expressions that retain the same Cb in adjacent utterances should share one of the following properties (in descending order of preference): 1.) SUBJECT; 2.) nonSUBJECT.

(16)
Centering Constraint [Englisch]
Two unstressed pronouns that retain the same Cb in adjacent utterances should share one of the following properties (in descending order of preference): 1.) SUBJECT; 2.) nonSUBJECT.

Parallelism in Cb-establishment

The given property-sharing constraint has o far been proposed for pronominal elements that retain the same Cb in adjacent utterances. By its reference of the grammatical property SUBJECT, the constraint indicates that adjacent utteraces of the same Cb cohere even better when there is a certain degree of **grammatical parallelism.**

Ambiguous multi-pronouns.

(17)
1. Max is waiting for **Fred.**
2. **He** invited **him** to dinner.
[preference: Max invited Fred]

(18)
[single pronoun]
1. **Carl** is talking to Tom in the Lab.
2. Terry as just looking for **him**.
[preference: him= Carl]

(19)
[unambiguous two pronouns]
1. Max is waiting for Susan.
2. She invited him to dinner.

Explicitly signalled parallelism

(20)
[Contrast this with (18)]
1. Carl is talking to **Tom** in the Lab.
2. Terry wants to talk to **him** too.
[preference: him = Tom]

(21)
[Sidner 1979]
1. The green Whitierleaf is most commonly fond near **the wild rose**.
2. The wild violet is found near **it** too.
[it = wild rose]

Ident (Speaker Identification)

(22)
Empathy (Kuno & Kaburagi 1977)
Empathy is the speaker-identification, with varying degrees, with a person who participates in the event that he describes in a sentence.

The unmarked Ident is the SUBJECT, but some words have nonSUBJECT Ident:

e.g.

ageru (give) and *morau* (receive) have SUBJECT Ident

kureru (give) has OBJECT2 Ident

iku (go) has SUBJECT Ident

kuru (come) has nonSUBJECT Ident

(23)

1. Masao wa Aabia-go o naratte-iru.
Massao TP-SB Arabic OB is-learning.
"Massao el learning Arabic."

2. Aruhi Φ Arabia-zin no zyosei ni atta.
One –day SB Arbian of lady to met.
"One day [he] met an Arabian lady.
<Ident=SUBJ>
[Cb<SUBJ>=Massao]

3. Φ Φ Iroiro sinsetu-ni **site-kureta**.
SB O2 variously kindly do-gave.
"Φ gave various kind favors to Φ."
<Ident=OBJ2>

[strong preference:
The lady gave favors to Masao]
<Zero-SUBJ= lady, zero-OBJ2=Masao>

(24)

Centering Constraint [Japanese](final version)

Two zero pronominals that retain the same Cb in adjacent utterences should share one of the following properties (in descending order of preference): 1.) Ident_SUBJECT, 2.) Ident alone, 3.) SUBJECT alone, 4.) nonIdent-nonSUBJECT.

Perception verbs: possible link to Ident

(25)
1. Dan went to a party yesterday.
2. He saw his high school friend Jim.
[Cb<SUBJ>=Dan]
3. He **looked** awfully pale.
[preference:Jim looked pale (to Dan)]

(26)
1. Maria finally got her phone reconnected.
2. She called her sister Bella.
[Cb<SUBJ>=Maria]
3.She **sounded** depressed.
[preference: Bella sounded depressed (to Mary)]

➔ Approximation to German?

A Discourse Copying Algorithm for Ellipsis and Anaphora Resolution

Andrew Kehler

Verb-Phrase ellipsis:

(1)
John likes his mother, and Bill does to

The clause the *VP is copied from* is termed the *source* clause, and the *clause which contains the elided VP* is termed the *target* clause

Under DSP (Dalrymple et.al.)Analysis
Strict reading: Bill likes John's mother
Sloppy reading: Bill likes his own mother

Resolution Algorithm

1. Identify the source clause representation and formulate a parallel structure with unfilled roles and modifiers for the target.

2. Fill roles with entities given in the target clause.

3. Copy remaining empty role fillers from the source:
   (a) Identify parallel elements, i.e. the objects in the source representation corresponding to the empty roles in the target (elements share the same thematic role).

   (b) All role fillers may be (i) **referred** to, where the appropriate function is used to **link the role** filler to the corresponding object in the source representation. In the case that the role filler is a function with a link to the source event, it may also be (ii) **copied**, where a new instantiation of the function is created and the source event variable is replaced with its corresponding parallel target event variable.

Referring will result as strict reading
Copying as Sloppy reading
Role linking rule: A referential element is linked to the most immediate coreferential element that
c-commands it in the syntax

Ellipsis

(27)
John likes his mother and Bill does too.

Source clause:

E1: [predicate: like
agent: John
theme: [obj: mother
poss: agent (*E1*)]

Parallel event for the target is constructed (Step 1)**, and *Bill* is added as the agent** (Step 2):

E2: [predicate:
agent: Bill
theme:]

Referring to the theme role of *E1* yields the strict reading:

E2: [predicate: like
agent: Bill
theme: theme (*E1*)]

Bill likes John's mother

Copying the theme role of *E1* yields the sloppy reading:

E2: [predicate: like
agent: Bill
theme: [obj: mother
poss: agent (*E2*)]]

Bill likes Bill's mother

Cascaded Ellipsis

John realises that he is a fool, but bill does not, even though his wife does.

Possible Reading:

John realises that John is a fool, but Bill does not realise that Bill is a fool, even though Bill's wife realises Bill is a fool.

Stripping

John likes John's Mother, and Mary's too

Only one reading (Role linking Rule):

John likes Mary's mother

Missing Readings

Bill believed that he loved his wife, and Harry did too.

Possible Readings:

1. Harry believed that Bill loved Bill's wife.
2. Harry believed that Harry loved Harry's wife.
3. Harry believed that Harry loved Bill's wife.

Missing Reading (Role linking Rule):

4. Harry believed that Bill loved Harry's wife.

5-Reading Example

John revised the paper before the teacher did, and Bill did too.

Possible Readings:
John revised John's paper before the teacher revises John's paper.
John revised John's paper before the teacher revised the teacher's paper.

Bill revised John's paper before the teacher revised John's paper.
Bill revised Bill's paper before the teacher revised Bill's paper.
Bill revised Bill's paper before the teacher revised John's paper.
Bill revised John's paper before the teacher revised the teacher's paper.
Bill revised Bill's paper before the teacher revised the teacher's paper.

Missing Reading
Bill revised John's paper before the teacher revised Bill's paper.